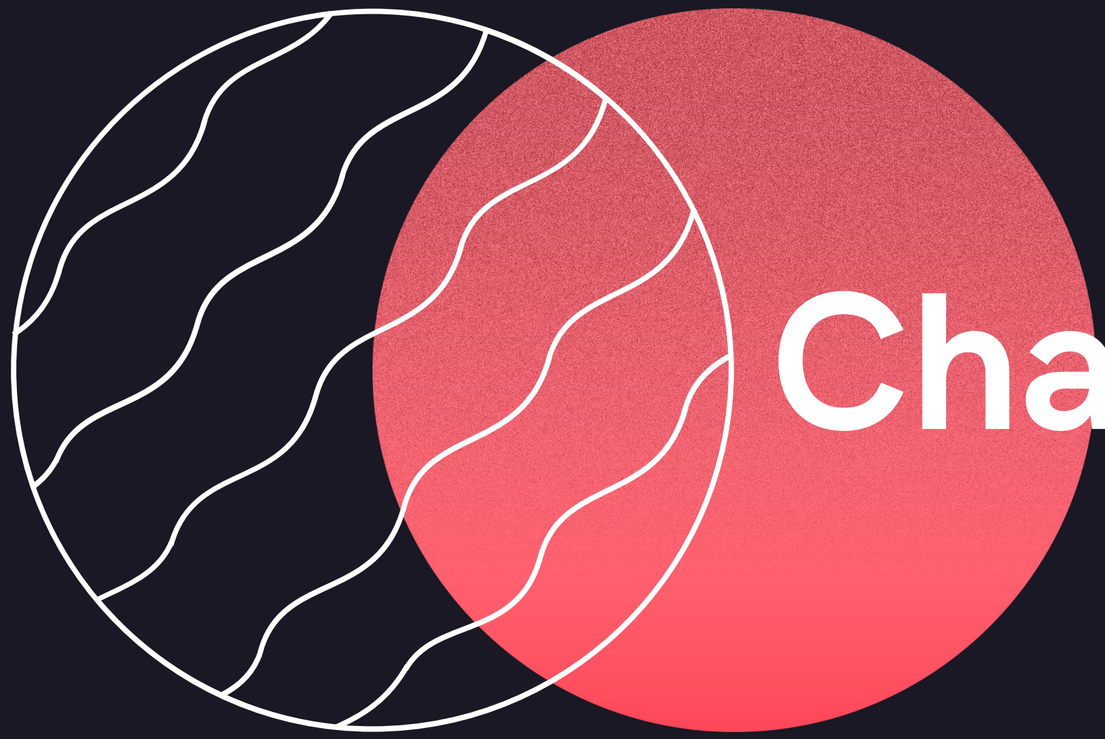
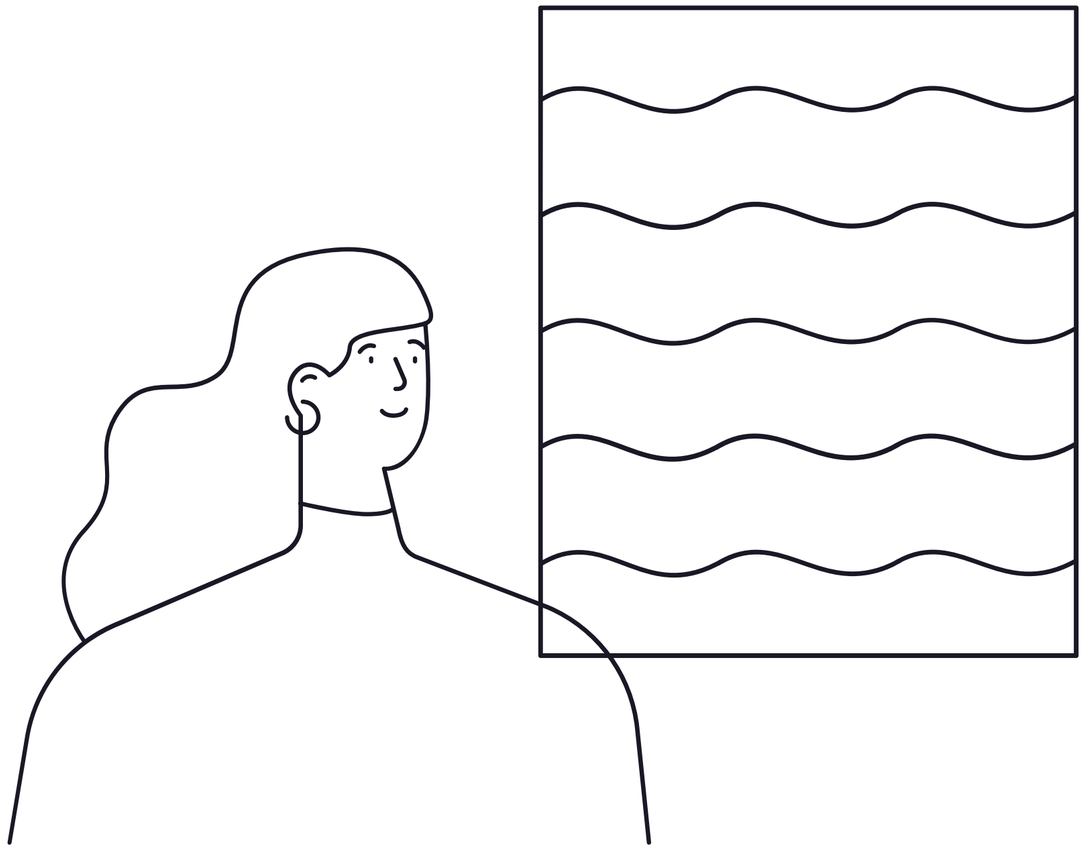


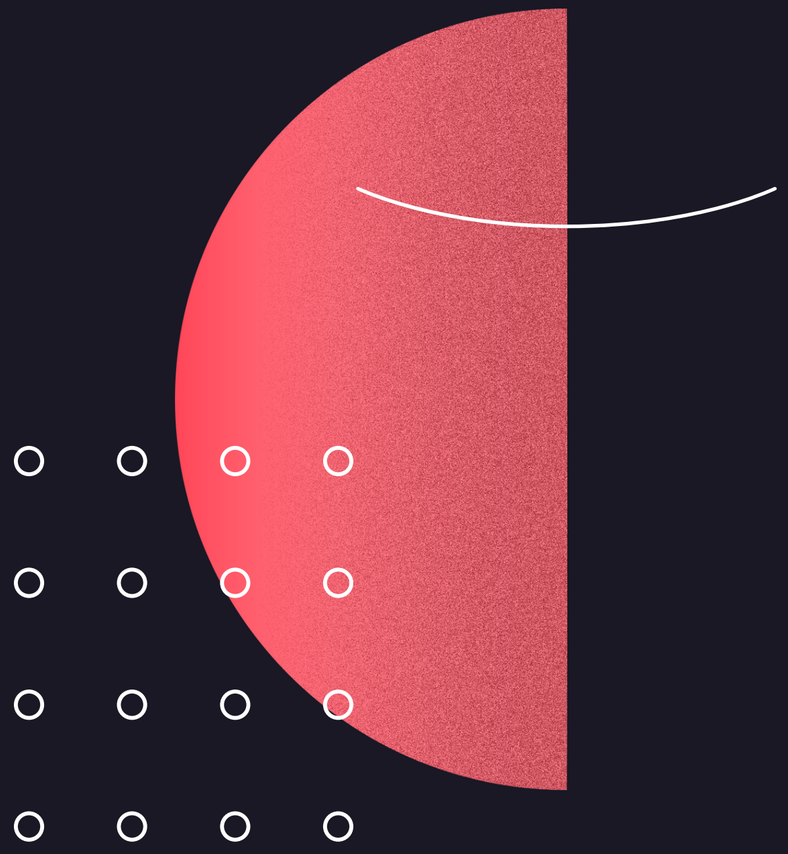
Chapter 19

Toolsets

What is a toolset?

Any integrated computer software system that is specifically designed to support a significant part of the information systems development process of an information system and the management of these tasks and processes.

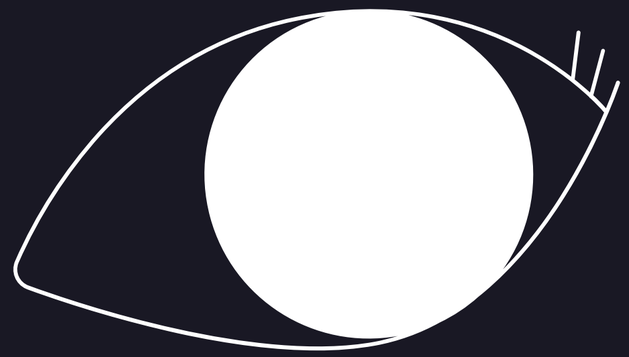




Integration in these toolsets are particularly important. They are integrated both horizontally and vertically.

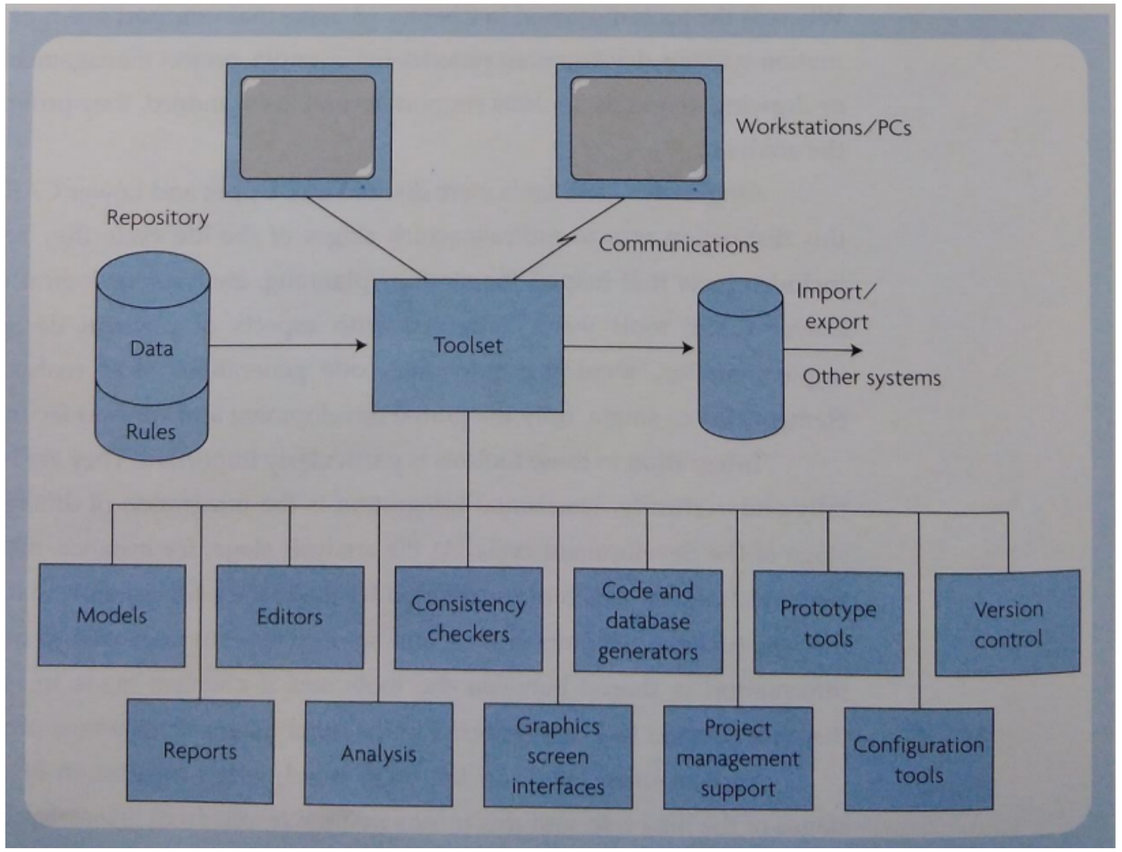
Horizontal integration is the integration of different tools at a particular stage of the development cycle. (Disney & Pixar)

Vertical integration, is the integration of tools between different stages of the life cycle, and this means that the results from one stage should be available in an automated form to the other stages. (Mobile)



Toolsets should ensure that the work is coordinated and consistent. An important aspect of this is version control. That is, the organizing and handling of the large numbers of different versions of systems that exist. (Github, Azure)

AN INTEGRATED TOOLSET



What is important in this diagram is the repository on the middle left, it is important because it enables the integration of all the models, definitions, and mapping of stages. The precursors of systems repositories were data dictionary systems (DDSs), this is software tools for managing the data resource.

AN INTEGRATED TOOLSET CONT.

The repositories will normally contain information about the physical and operational elements of data and processes (physical data items, processes, modules, code, and test data) and information about logical and functional levels as well (data, process models and diagrams)

Active repositories contain important information that enables the rules of a technique or an information systems development methodology to be applied. These may permit analysis, validation, consistency and completeness checking.

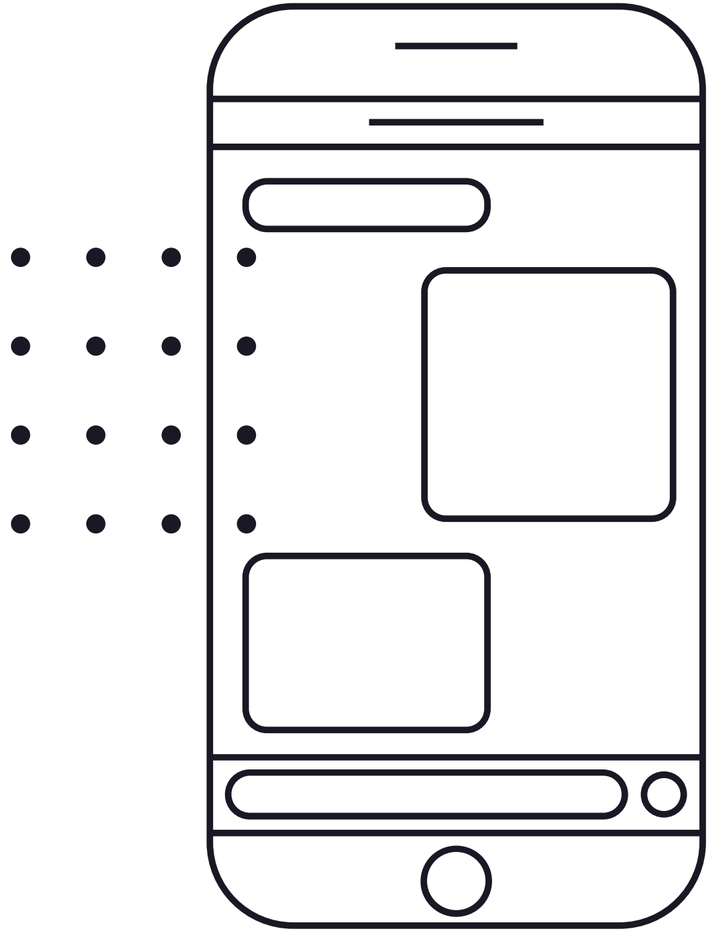
The repository can contain information beyond that which is needed to create software systems, and include models of the organization and environment.

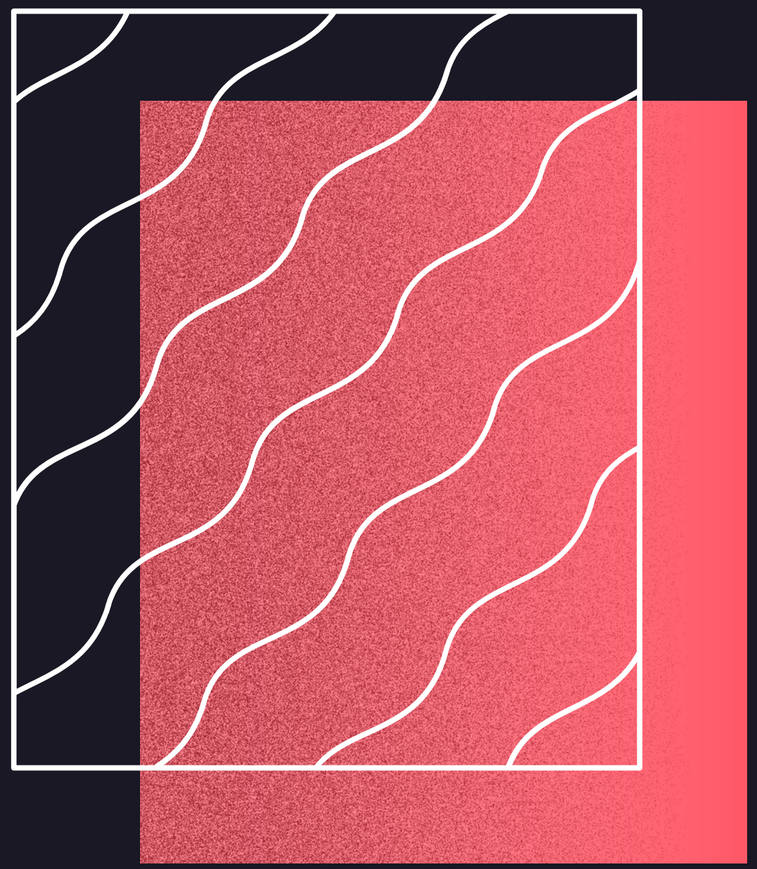
INFORMATION ENGINEERING FACILITY 08

Information Engineering Facility (IEF) is an example of an integrated toolset or CASE tool

IEF supports planning, analysis, design, construction, and implementation.

Each stage will be discussed.





PLANNING

The planning software is designed to support a strategic approach to systems development following the identification of high-level business requirements. It helps in the production of three architectures: the information architecture, the business system architecture, and the technical architecture.

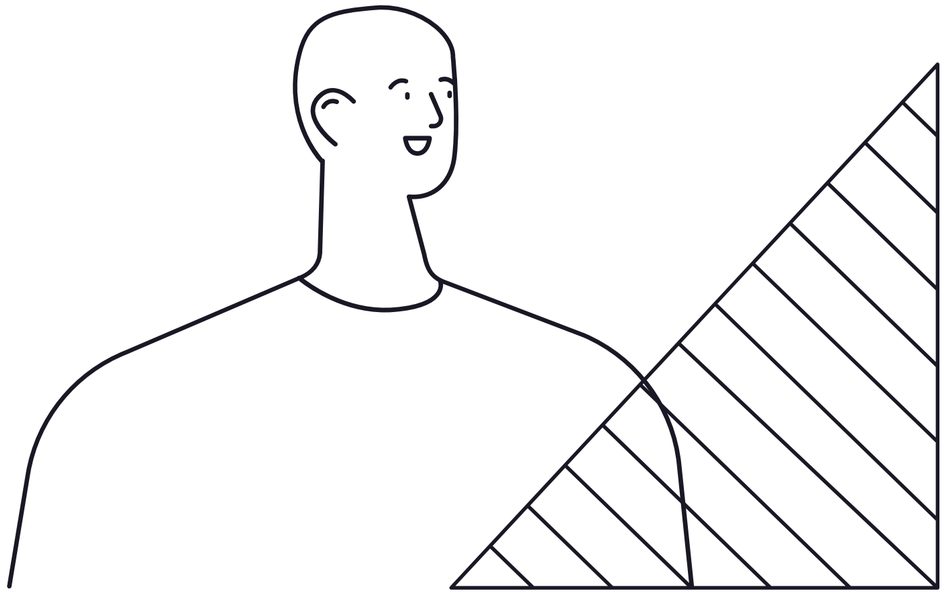
Planners also construct high-level function hierarchy diagrams, using the activity hierarchy diagramming tool, which enables the functions and their position in the hierarchy to be captured and displayed in various ways.

ANALYSIS

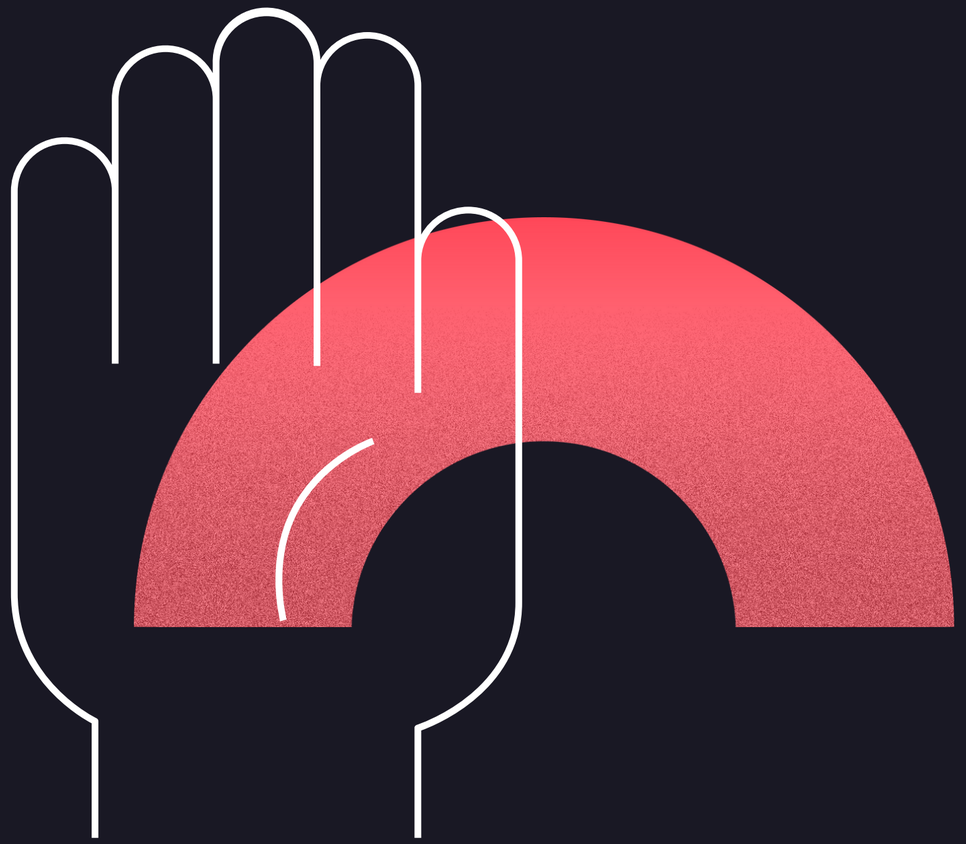
Analysis refines a particular area of the business identified in the planning stage, and any information captured in the planning software is automatically available to the analysis software using.

In this tage, analysts enter further details, often using the same software as in the planning stage.
For example, the subject area diagram is expanded into an entity-relationship diagram using the data modeling software.

The elementary processes are then defined as action diagrams using the process action diagramming tool. The action diagram defines the steps required for each elementary process and the way that they interact with the entities. (Tables)



DESIGN



In IE terms, this includes support for both business systems design and technical design, and the design software enables the designer to take the results of analysis and transform them into designs.

The process action diagrams from analysis can also be converted into procedure action diagrams using the action diagramming software. Designers can specify the detailed logic statements and associate processes, with commands from keyboard, specify run-time errors routines, and so on.

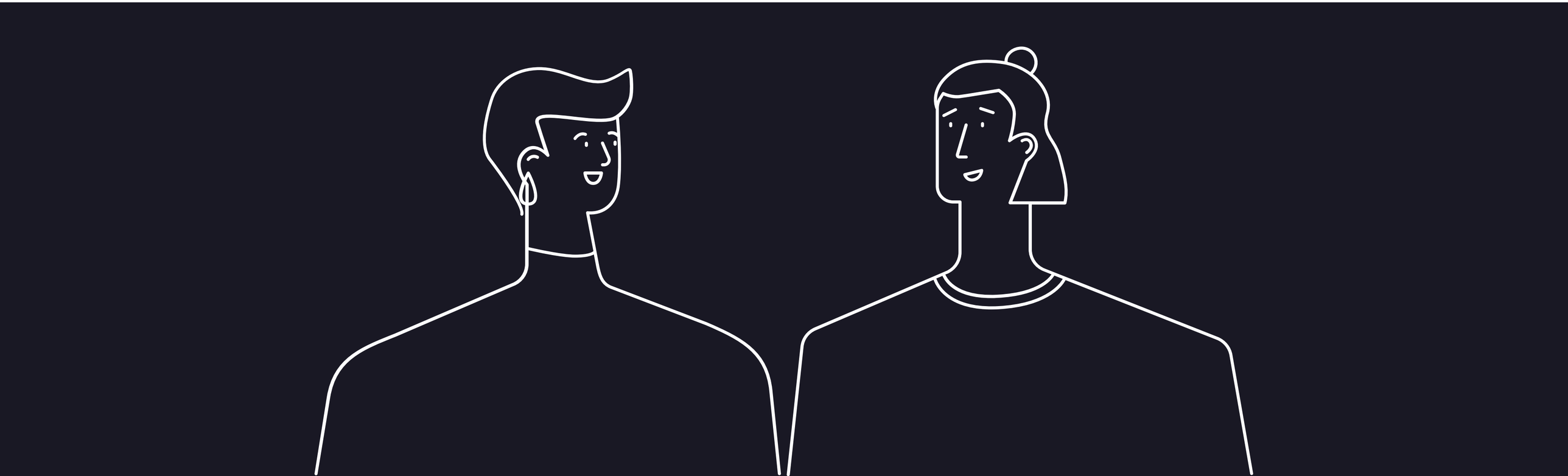
Up to this stage, the design has been at the logical level and not dependent on any target hardware or software enviroment.

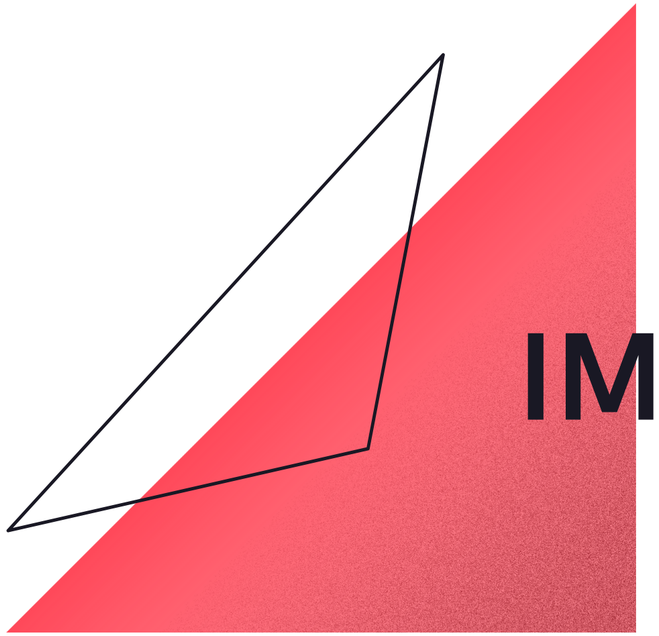
CONSTRUCTION

The next stage is construction and the automatic production of complete application systems by the generation of code.

The code generated is based on the logic specified in the action diagrams and the entity models

Developers can test and modify the code without tampering with the source code. Changes are made to the code by changing the action diagrams and regenerating the code. (pre-production)





IMPLEMENTATION

The implementation software (which resides on the target hardware) enables the installation of code and database on the computer.

This includes the compilation, linking, and binding of the application, and the allocation and building of the database.

BENIFITS OF USING INTEGRATED TOOLSETS

Improvements in management and control

Toolsets can help in this process by providing a central repository of information concerning the project, including rules and standards to be followed, and experience from other projects, such as the length of time certain activities actually take in the organization

Improvements in system quality

Tools can help overcome these problems by providing better and more complete specifications through the use of diagrammatic representations that are easily modifiable by developers and users.
(HAVING WHITE BOARDS)

BENIFITS OF USING INTEGRATED TOOLSETS CONT.

Improved designs, better reflecting the specifications

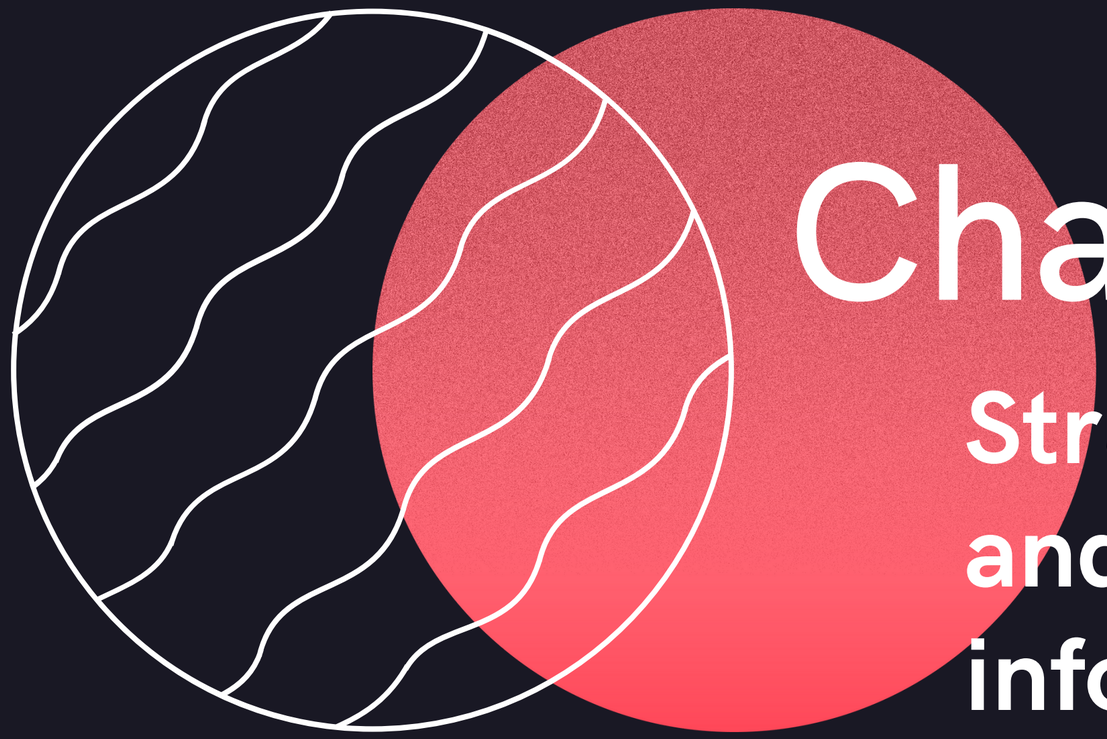
Tools can help by providing the necessary information from the specification, having it available to designers from the repository, and automating some of the processes.

Automated checking for consistency according to the rule base

Tools can automatically check the consistency of information input at the analysis and design stages, including information input using models and diagrams.

Summary of Chapter 19

- A toolset is any integrated computer software system that is specifically designed to support a significant part of an information system development process of an information system and the management of these tasks and processes
- A repository contains information about the physical and operational elements of data and processes. It will also hold the rules of a technique or an information systems development methodology thus permitting analysts, validation. consistency, and completeness checking.
- Befits of using toolsets include: Improvements in management and control, Improvements in system quality, Improved designs, better reflecting the specifications and Automated checking for consistency according to the rule base

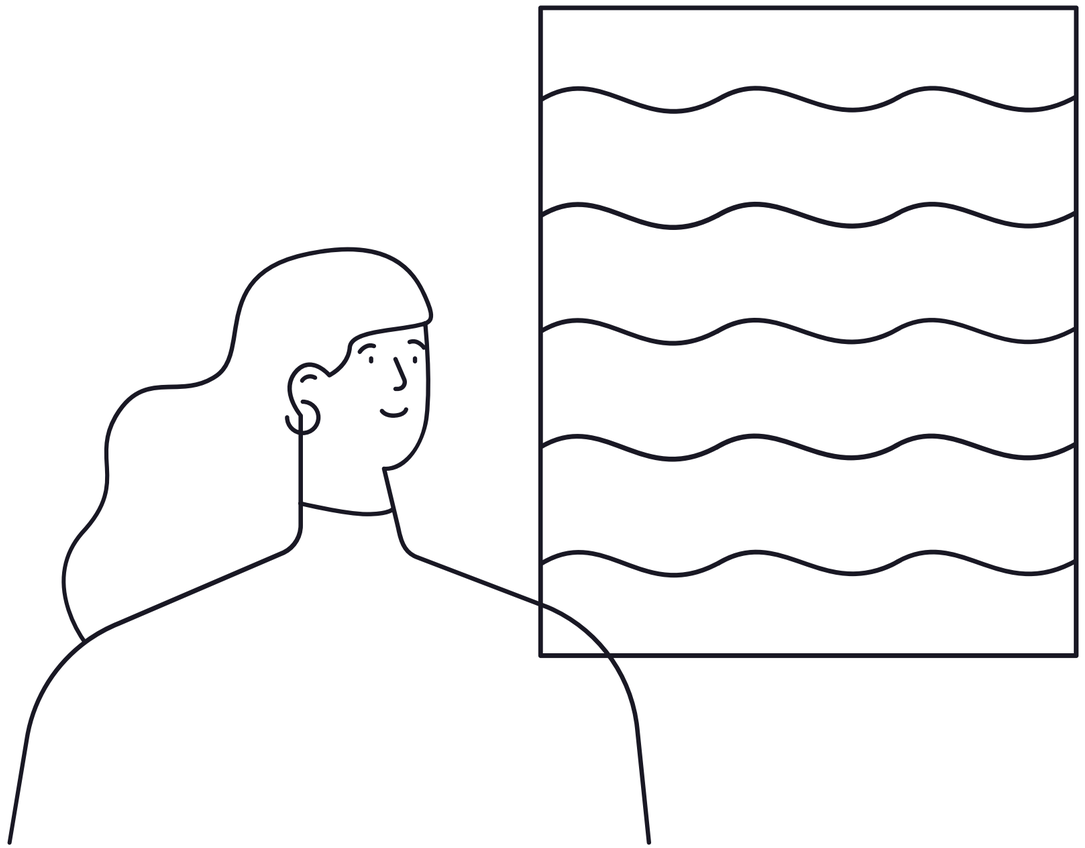


Chapter 20

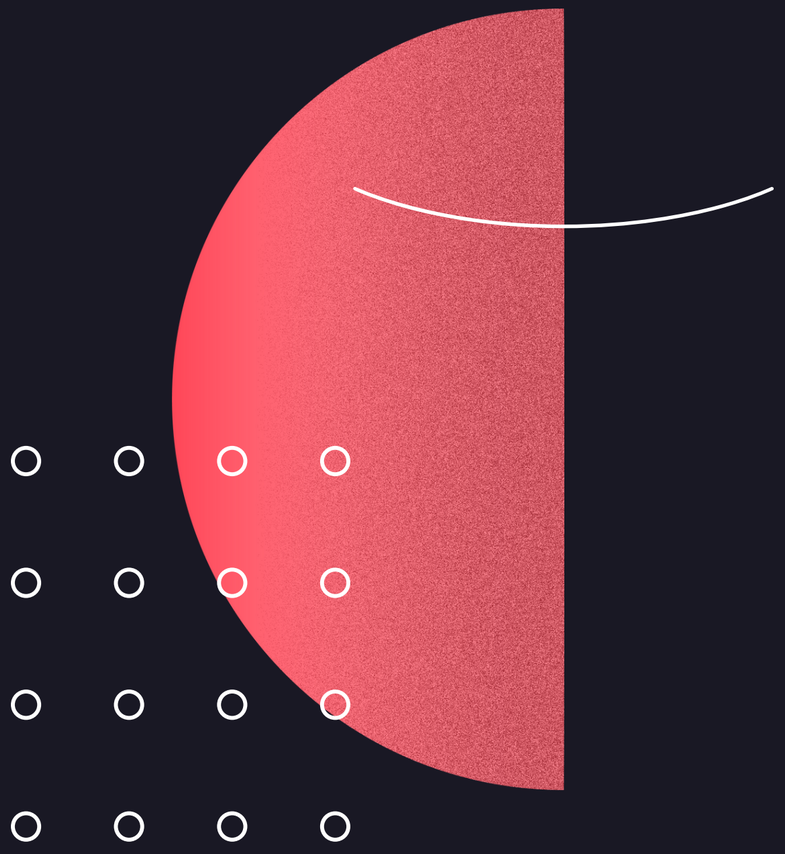
Structured analysis, design, and implementation of information systems (STRADIS)

Structured design is concerned with the selection and organization of program modules and interfaces that would solve a predefined problem. However, it makes no contribution to the definition of that problem.

A number of people have therefore attempted to take the concepts of structured design and apply them to systems analysis, in order to develop a method of specifying requirements and to provide an interface to structured design.

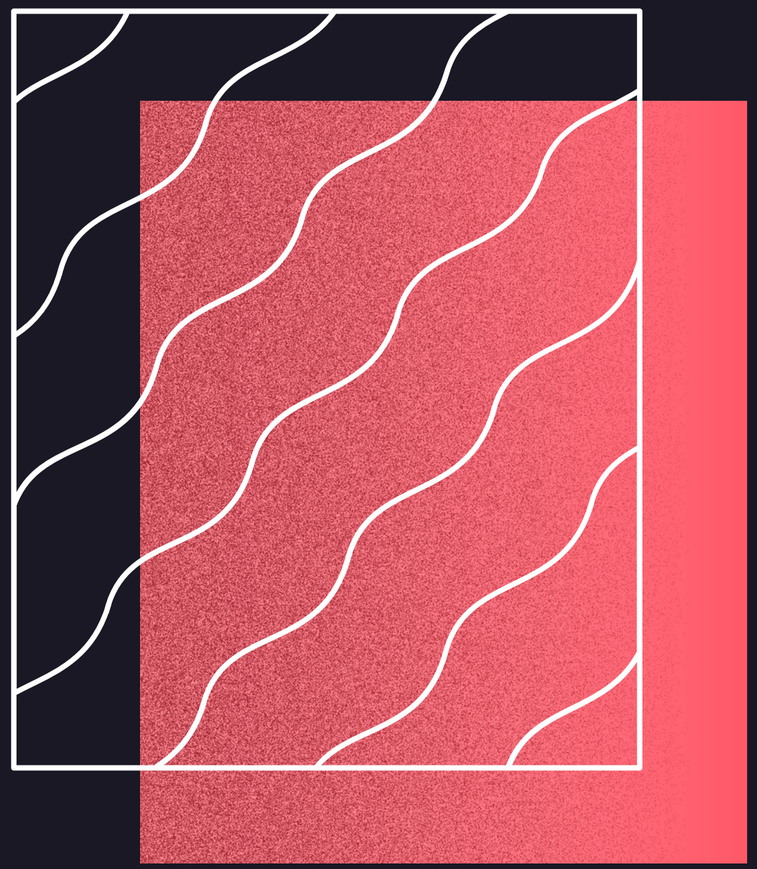


The most important aspects of STRADIS methodology is the bringing together of many techniques which were separate.



STRADIS is conceived as being applicable to the development of any information system, irrespective of size and whether or not it is going to be automated.

In practice however it has mainly been used and refined in environments where at least part of the information system is automated.



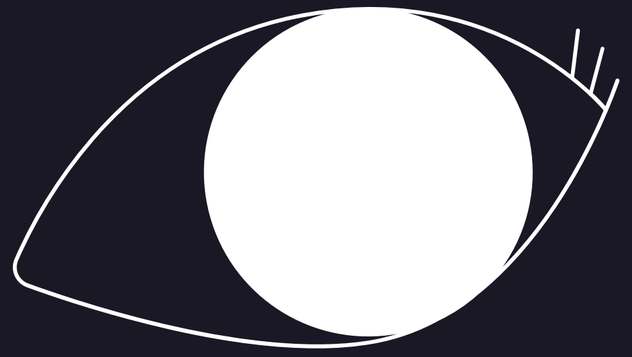
CHAPTER LAYOUT

This Chapter describes three methedologies:

1. Gana and Sarson
2. Yourdon System Method
3. Jackson System Development

Each of them will be discussed along with their steps

GANA AND SARSON



INITIAL STUDY

The starting point of the methodology is an attempt to ensure that the systems chosen to be developed, are those that most warrant development in a competing environment.

The most important criterion in this selection process is argued to be the monetary costs and benefits of each proposal.

DETAILED STUDY

This takes the work of the initial study further. In particular, the existing system is examined in detail.

As part of this investigation, the potential users of the system are identified. These users will exist at three levels:

1. The senior managers with profit responsibilities. The senior managers with profit responsibilities, they initially commissioned the system proposal.

2. The middle managers of the department are affected.

3. The end-users, this is the people who actually work directly with the system

The results of the detailed study are presented to management, and decisions will be made either to stop at this stage or proceed to the next phase. (Not feasible)

DEFINING AND DESIGNING ALTERNATIVE SOLUTION S

The next phase defines alternative solutions to the problems of the existing system. First, the organizational objectives, as defined in the initial study, are converted into a set of system objectives.

The system objectives should be strongly stated. This means that they should be specific and measurable, rather than general. (cut down on prices)

A report should contain the following:

- DFD of current system
- Limitations of the system

Design should include statements covering:

- Parts of DFD that should be implemented
- Estimated costs and benefits

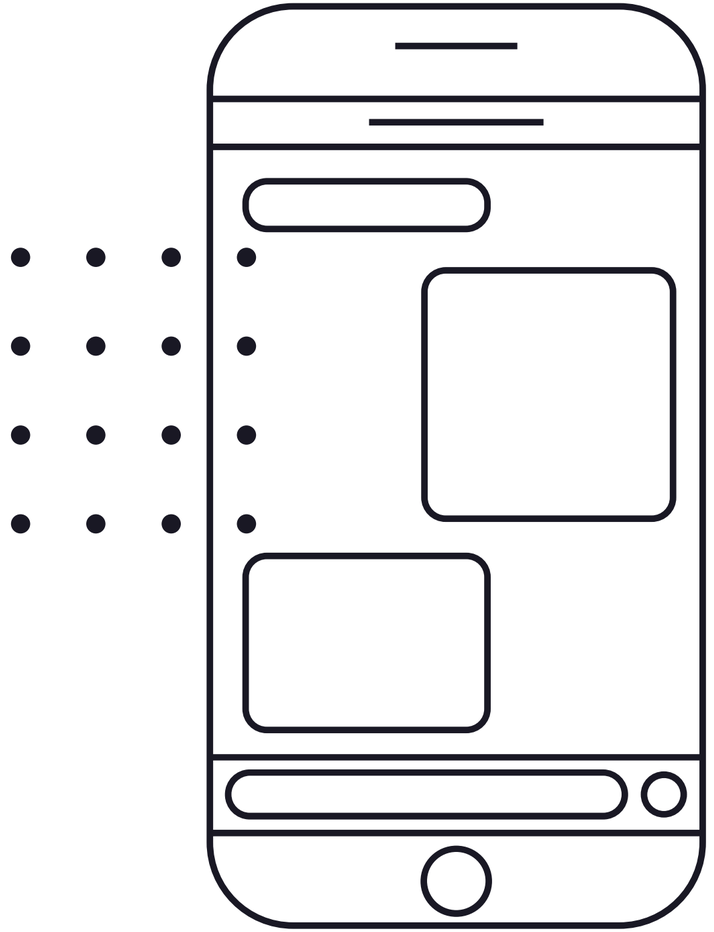
PHYSICAL DESIGN

The first step is to identify which type of system is being described.

It is recommended that the raw input data flow is traced through the DFD until a point is reached at which it can no longer be said to be input, but has been transformed into some other data flow. (Magic Data)

The final task in this phase is the definition of any clerical tasks that the new system will require.

The clerical tasks are identified according to where the automated system boundary is on the DFD and according to what physical choice of input and output media has been made.

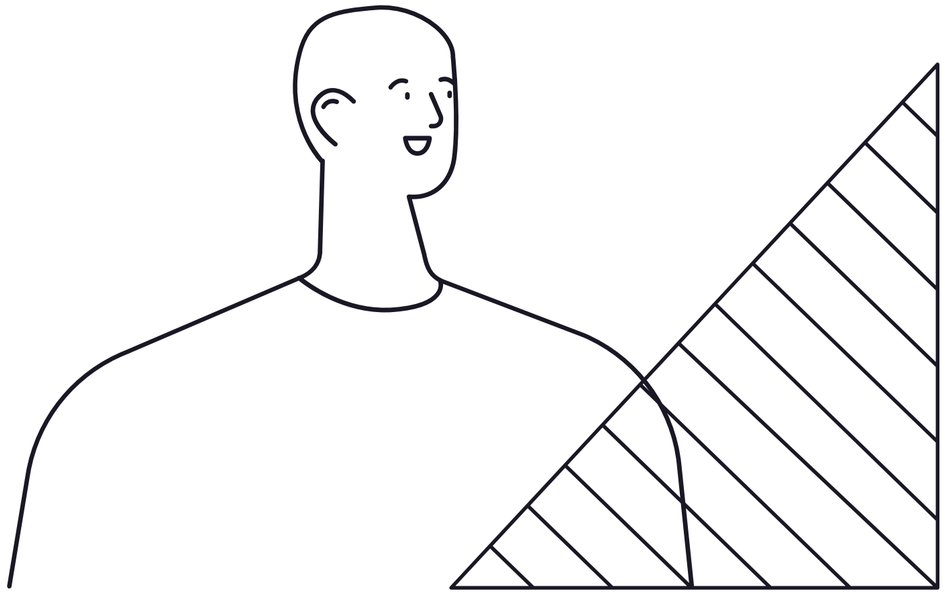


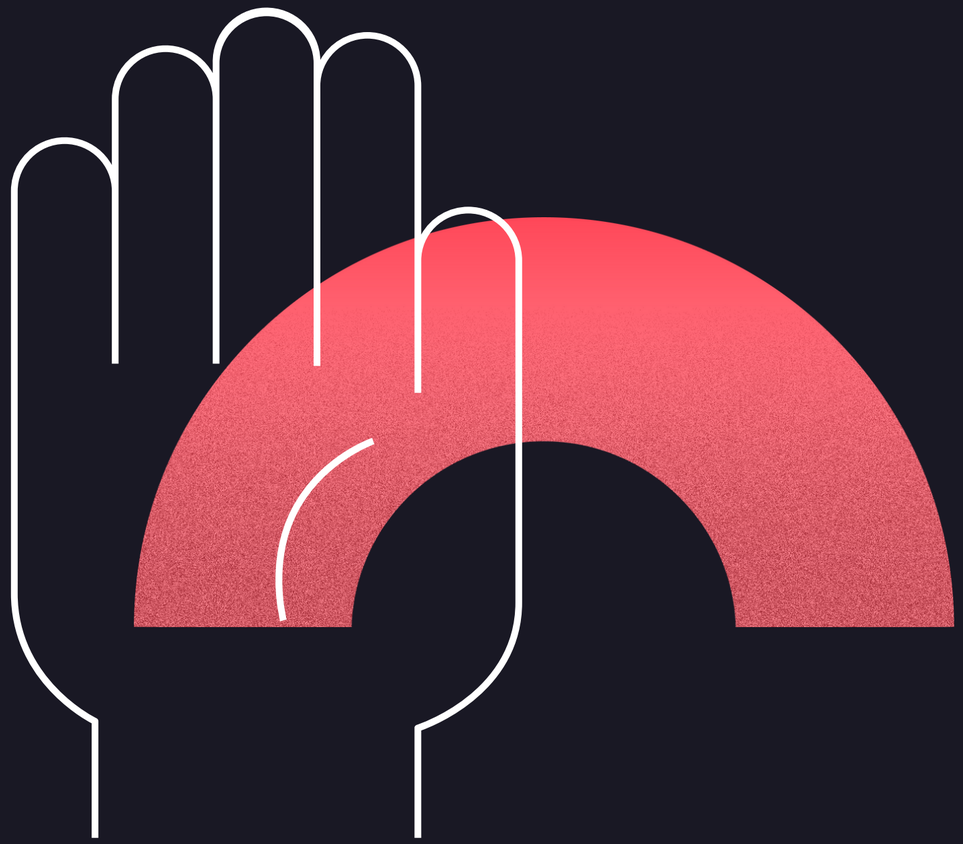
YOURDON SYSTEMS METHOD

YSM was originally very similar to STRADIS.

There are three major phases in the YSM approach:

1. Feasibility Study
2. Construction essential model
3. Constructing implementation model





FEASIBILITY STUDY

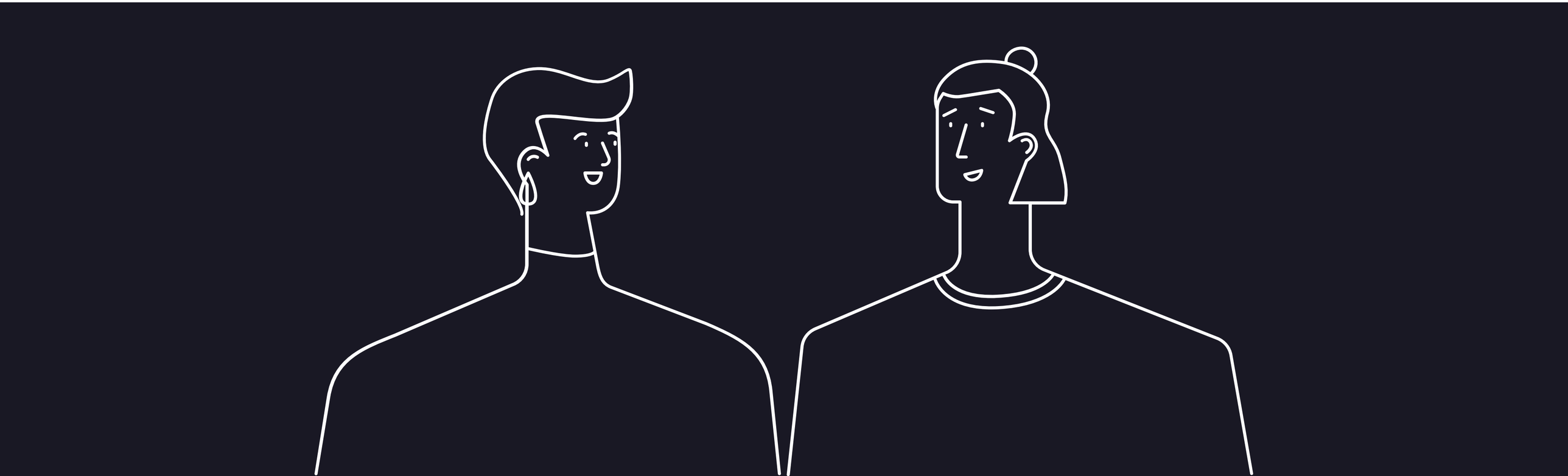
The feasibility study looks at the present system, its environment, and the problems associated with it. The objective here is to get a general understanding and an overview of the existing system.

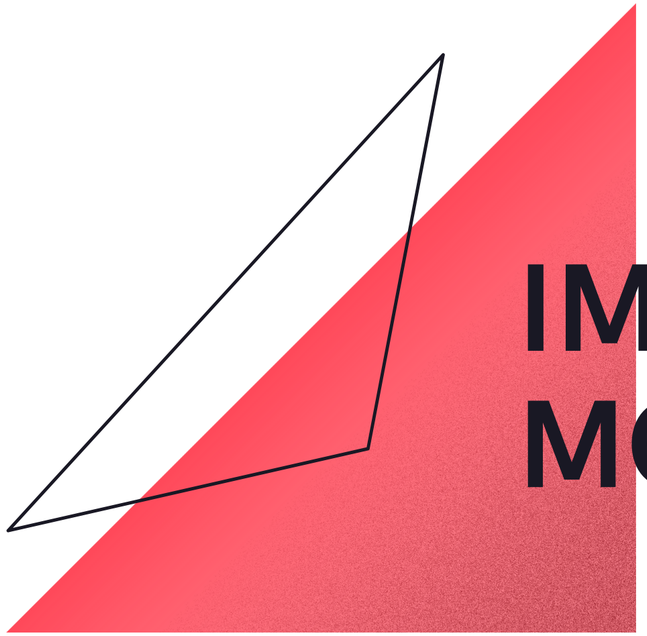
ESSENTIAL MODELLING

This stage gains the most emphasis in YSM. There is both an enterprise and a behavioral model.

The environmental model defines the boundary between the system and the environment in which the system exists. (Efundi, writing a test)

The behavioral model is a model of what the internal behavior of the system must be in order to deal with the environment successfully. (Efundi, mark these tests)





IMPLEMENTATION MODELLING

This phase starts the systems design process. The limitations of such factors as the technology available, performance requirements, and feasibility can change the essential model.

JACKSON SYSTEMS DEVELOPMENT

JSD argues that system design is an extension of the program design task and that the same techniques can be usefully applied to both.

There are three major phases in JSD:

1. The modeling phase
2. The network phase
3. The implementation phase.

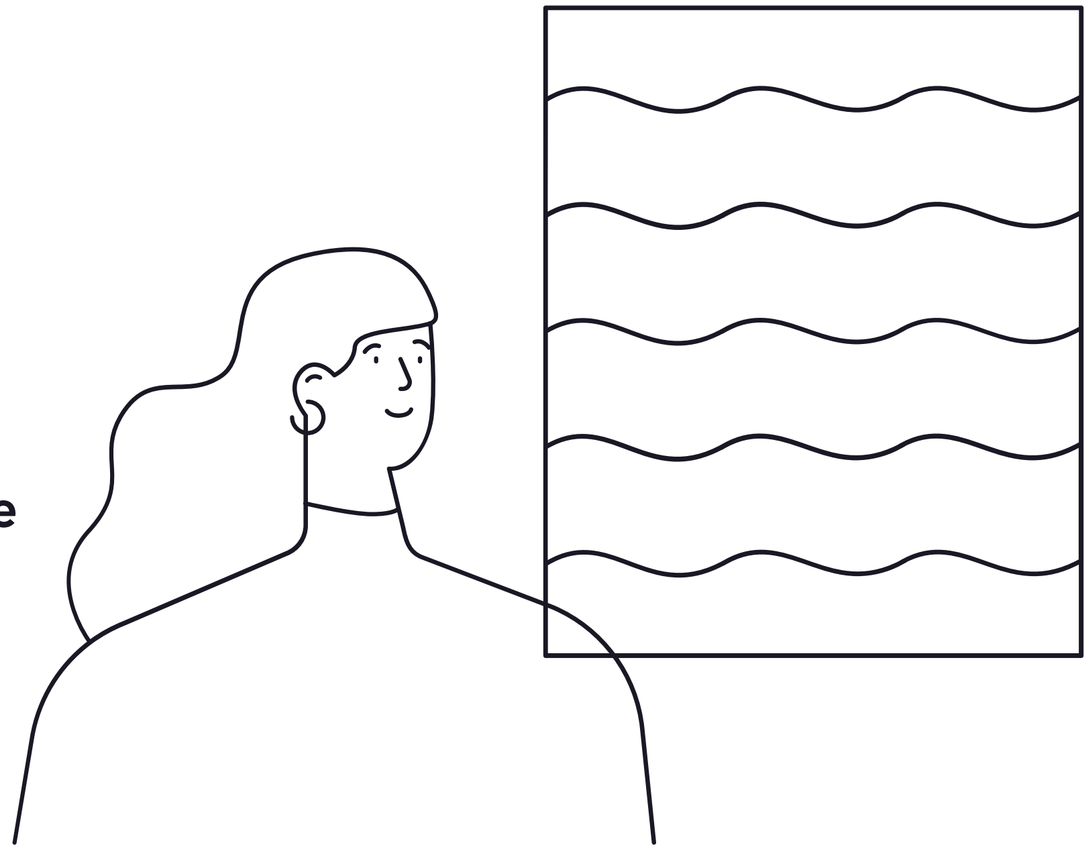
Modeling Phase

Entity action step

JSD aims to model the real world. In the entity action step, real-world entities are defined. These can include suppliers, customers, or part.

Entity structure step

The actions of an entity are ordered in time and are expressed diagrammatically. They show the structure of a process in terms of sequence, selection, and iteration.



NETWORK PHASE

Initial model step

Create a model that is a simulation of the real world.

In the model there will be a sequential process for each instance of an entity type, not one process for all instances.

Function step

Further elaboration takes place, and functions are added to the model to ensure that the required outputs are produced when certain combination of events occur. (Efundi, ACL)

System timing step

Explicit consideration is given to permissible delays between receipt of inputs and production of outputs. As different parts of the system may be subject to different time lags.

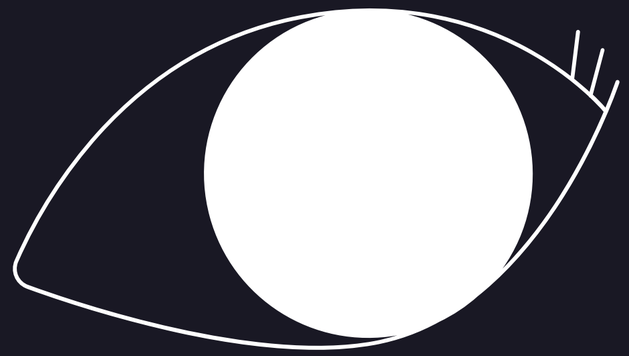
IMPLEMENTATION PHASE

PHYSICAL SYSTEM SPECIFICATION STEP

This step includes activities that would be regarded in other methodologies as 'systems design'. (file or database design)

The purpose of System Design is to create a technical solution that satisfies the functional requirements for the system.

Many organizations look at System Design primarily as the preparation of the system component specifications. (Efundi, full cycle)



Summary

This Chapter describes three methedologies:

1. Gana and Sarson
2. Yourdon System Method
3. Jackson System Development

Thank you

Enrico Dreyer